PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P36676A/DBR/GMU	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/GB2005/000482	International filing date *(day/month/year)* 11.02.2005	Priority date *(day/month/year)* 18.02.2004
International Patent Classification (IPC) or national classification and IPC B42D15/00, G07D7/20		
Applicant TULLIS RUSSELL PAPERMAKERS LIMITED ET AL.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 8 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☒ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
08.09.2005	15.02.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Dewaele, K Telephone No. +31 70 340-2361

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2005/000482

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-27	as originally filed
Claims, Numbers	
1-36	received on 08.09.2005 with letter of 02.09.2005
Drawings, Sheets	
1/2, 2/2	as originally filed

   ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☒ the claims, Nos. 28,29,31,32,33,35
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/GB2005/000482

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	3-7,9,16-36
	No:	Claims	1,2,8,10-15
Inventive step (IS)	Yes:	Claims	16-36
	No:	Claims	1-15
Industrial applicability (IA)	Yes:	Claims	1-36
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item I

Basis of the report

The amendments filed with the letter dated 02 September 2005 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:

1. "image-making apparatus": this expression replaces "camera", but no basis could be found in the application as filed. The passage cited by the applicant (p.26 l.8-10) does not explicitly disclose such an apparatus nor render it obvious. Furthermore, it could be taken as synonym, since an "image-making apparatus" can also be a printer or even an image made with a computer.
   Therefore, this feature has not been considered in the following claims: 28, 31, 32.
2. Following this amendment, "camera image" has been replaced by "image", rending the subject-matter unclear (Article 6 PCT). Therefore, this amendment has not been considered in the following claims: 29, 31, 35.
3. In claim 33, last word "image" replaces "object", thereby rending the subject-matter unclear. Therefore, this amendment has not been considered.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following document:

D1 : DE 102 04 870 A1 (INFINEON TECHNOLOGIES AG) 14 August 2003 (2003-08-14)

D2: US-A-6 035 914 (RAMSEY ET AL) 14 March 2000 (2000-03-14)

D3: GB-A-2 324 065 (JAMES HOWARD SLATER; DAVID JOHN HARDMAN) 14 October 1998 (1998-10-14)

2 **INDEPENDENT CLAIM 1**

Document D1 discloses (the references in parentheses applying to this document) an object (1) having a primary identifier (2) in the form of a plurality of identification elements (2) embedded in the object (1) (§ [0010], col.2 l.45), the identification elements (2) being visually detectable when illuminated by infrared or ultraviolet electromagnetic

radiation (§ [0010], col.2l.52-56) but being visually indistinguishable from the rest of the object when illuminated with visible light (implicit, § [0010]); wherein the identification elements (2) are randomly distributed (§ [0010], col.2 l.54) so that the positions of the identification elements (2) are unique to the object (1) (§ [0010], col.2 l.56-58); and wherein the object (1) is provided with a reference point in the form of a printed symbol (fig. 1: barcode or serial number) defining an area of the object (1) in which at least some of the identification elements (2) are provided (see figure).
Therefore, claim 1 is not new (Article 33(2) PCT).

3 DEPENDENT CLAIMS 2-15

3.1 Claims not new (Article 33(2) PCT):

- Claim 2: D1 discloses fibres (2 §[0010]);
- Claim 8: D1 discloses a barcode (3 §[0027]);
- Claim 10: see D1, §[0026];
- Claims 11-15: see D1, §[0027];

3.2 Claims not inventive (Article 33(3) PCT):

- Claim 3: obvious alternative, see D2, col.5 l.23;
- Claims 4-5: obvious alternative, see D3, p.5 l.23;
- Claims 6, 7: fluorescent elements are known as an alternative to IR- or UV-sensitive elements, and are likely disclosed in D2 col.5 l.64 to col.6 l.12;
- Claim 9: design option.

4 INDEPENDENT CLAIM 16

4.1 D1 discloses (the references in parentheses applying to this document): A method of verifying that an object (1) is genuine, including the steps of:

- creating a genuine object (1) having a primary identifier (2) in the form of a plurality of identification elements (2) embedded in the object (1) (§ [0010], col.2 l.45), the identification elements (2) being detectable when illuminated by infrared or ultraviolet electromagnetic radiation (§ [0010], col.2 l.52-56) but being indistinguishable from the rest of the object when illuminated with visible light (implicit, § [0010]); wherein the identification elements (2) are randomly distributed (§ [0010], col.2 l.54) so that the positions of the identification elements (2) are unique to the genuine object (1) (§ [0010], col.2 l.56-58)
- comparing measured information relating to the positions of identification elements

(2) in an object (1) to be verified with the recorded information for the genuine object (1) (§ [0011]).

4.2 The differences between claim 16 and D1 are:

(a) the step of identifying a sub-area of the genuine object defined by the reference point;

(b) recording information relating to the positions of identification elements in the sub-area of the genuine object relative to the reference point.

Claim 16 is therefore new (article 33(2) PCT).

4.3 The problem to be solved is how to provide a method of verifying an object which requests less time than existing methods, and with a better accuracy while repeated verifications.

4.4 Such a solution is not disclosed in the prior art. There is no hint for a person skilled in the art to add the step of identifying a sub-area defined by a reference point, and to record the information relating to the positions of identification elements. This method allows further a short time of verification, since not all the identification elements have to be checked.

Claim 16 is therefore inventive (article 33(3) PCT).

5 INDEPENDENT CLAIM 31

5.1 Document D2 discloses (the references in parentheses applying to this document) a detector (fig.7) suitable for verifying that an object is genuine, comprising:

- a source of infrared or electromagnetic radiation (col.6 l.9-10, col.7 l.40-50);
- a camera (col.7 l.55-56);
- an image analysis equipment ("electronics" fig. 7) for converting the camera image into an alphanumerical code (col.7 l.3 to col.8 l.48);
- a database into which the alphanumerical code can be recorded and from which alphanumerical codes relating to other camera images can be retrieved (col.7 l.3-32);
- and processing equipment adapted to compare the alphanumerical code relating to the object being verified with the other alphanumerical codes already stored in the database relating to recorded camera images (col.7 l.3-32).

5.2 The difference between claim 31 and D2 is:

The detector is suitable for verifying an object as disclosed in claim 1 as filed, whereby the detector is adapted to identify a sub-area of the object defined by the reference point

and to record information relating to the positions of the identification elements in the sub-area relative to the reference point.
Claim 31 is therefore new (article 33(2) PCT).

5.3 The problem is here to find a detector adapted to identify areas of an object as defined in claim 1 as filed.

5.4 There is no hint for the person skilled in the art to modify a detector as disclosed in D2, which is not capable of identifying a sub-area of an object defined by a reference point. There is further no hint in the prior art for the person skilled in the art to develop such a detector.
Therefore, claim 31 is inventive (article 33(3) PCT).

6. DEPENDENT CLAIMS 17-30, 32-36

Claims 17-30 and 32-36 are dependent on claim 16 or 31 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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Claims

1. An object having a primary identifier in the form of a plurality of identification elements embedded in the object, the identification elements being visually detectable when illuminated by infrared or ultraviolet electromagnetic radiation but being visually indistinguishable from the rest of the object when illuminated with visible light; wherein the identification elements are randomly distributed so that the positions of the identification elements are unique to the object; and wherein the object is provided with a reference point in the form of a printed symbol defining an area of the object in which at least some of the identification elements are provided.

2. An object as claimed in claim 1, wherein the identification elements comprise fibres.

3. An object as claimed in claim 2, wherein the fibres are selected from the group consisting of viscose, wool, cellulose, and synthetic fibres.

4. An object as claimed in claim 1, wherein the identification elements comprise solid particulates.

5. An object as claimed in claim 4, wherein the identification elements are selected from the group consisting of mica, silica and synthetic particulates.

6. An object as claimed in any preceding claim, wherein the identification elements are fluorescent.

7. An object as claimed in any preceding claim, wherein the identification elements are provided with a fluorescent coating.

8. An object as claimed in any preceding claim, wherein the reference point does not have rotational symmetry.

9. An object as claimed in any preceding claim, wherein the reference point has the form of a T-shape.

10. An object as claimed in any preceding claim, comprising paper, plastic or metal.

11. An object as claimed in any preceding claim, also having a secondary identifier.

12. An object as claimed in claim 11, wherein the secondary identifier is unique to the object.

13. An object as claimed in claim 11 or claim 12, wherein the secondary identifier is printed on the object.

14. An object as claimed in any of claims 11 to 13, wherein the secondary identifier comprises a number.

15. An object as claimed in any of claims 11 to 13, wherein the secondary identifier comprises a barcode.

16. A method of verifying that an object is genuine, including the steps of:

creating a genuine object having a primary identifier in the form of a plurality of identification elements embedded in the object, the identification elements being detectable when illuminated by infrared or ultraviolet electromagnetic radiation but being indistinguishable from the rest of the object when illuminated with visible light, wherein the identification elements are randomly distributed so that the positions of the identification elements are unique to the genuine object, and wherein the genuine object is provided with a reference point in the form of a printed symbol;

identifying a sub-area of the genuine object defined by the reference point;

recording information relating to the positions of identification elements in the sub-area of the genuine object relative to the reference point; and

comparing measured information relating to the positions of identification elements in an object to be verified with the recorded information for the genuine object.

17. A method as claimed in claim 16, wherein only information relating to identification elements

within the sub-area of the genuine object is recorded.

18. A method as claimed in claim 16 or claim 17, including the step of measuring the positions of identification elements in the object to be verified.

19. A method as claimed in claim 18, wherein the positions of identification elements in the object to be verified are measured relative to a reference point in the object to be verified.

20. A method as claimed in any of claims 16 to 19, wherein the information relating to the positions of the identification elements in the genuine object is converted into an alphanumerical code and recorded in this form.

21. A method as claimed in claim 20, wherein the alphanumerical code is unique to that object.

22. A method as claimed in claim 20 or claim 21, wherein the measured information relating to the positions of identification elements in the object to be verified is also in the form of an alphanumerical code, and the step of comparing the information comprises comparing these alphanumerical codes.

23. A method as claimed in claim 22, wherein corresponding numbers in each alphanumerical code are compared to within a specified tolerance level.

24. A method as claimed in any of claims 16 to 23, wherein the genuine object is provided with a secondary identifier, and the method includes the step of detecting and recording information relating to the secondary identifier.

25. A method as claimed in claim 24, wherein the secondary identifier is unique to the object.

26. A method as claimed in claim 24 or claim 25, wherein information relating to the object to be verified is only compared to recorded information relating to genuine objects having the same secondary identifier.

27. A method as claimed in any of claims 16 to 26, wherein a plurality of genuine objects are created and recorded.

28. A method as claimed in any of claims 16 to 27, wherein the identification elements are fluorescent, and the method includes the steps of illuminating the identification elements with ultraviolet light and detecting the emitted electromagnetic radiation with an image-making apparatus.

29. A method as claimed in claim 28, wherein the image is analysed and converted into alphanumerical data.

30. A method as claimed in any of claims 16 to 29, wherein the genuine object comprises paper, and the method includes the step of adding the identification elements to the paper during the paper-making process.

31. A detector for verifying that an object is genuine, the object comprising a primary identifier in the form of a plurality of identification elements embedded in the object, the identification elements being detectable when illuminated by infrared or ultraviolet electromagnetic radiation but being indistinguishable from the rest of the object when illuminated with visible light, the identification elements being randomly distributed so that the positions of the identification elements are unique to the object, and the object further comprising a reference point in the form of a printed symbol,

the detector comprising:

a source of infrared or ultraviolet electromagnetic radiation;

image-making apparatus for making an image of at least a part of the object;

image analysis equipment for converting the image into an alphanumerical code;

a database into which the alphanumerical code can be recorded and from which alphanumerical codes

relating to other recorded images can be retrieved; and

processing equipment adapted to compare the alphanumerical code relating to the object being verified with the other alphanumerical codes already stored in the database relating to recorded images;

wherein the detector is adapted to identify a sub-area of the object defined by the reference point and to record information relating to the positions of the identification elements in the sub-area relative to the reference point.

32. A detector as claimed in claim 31, wherein the detector is adapted to detect the location of the reference point on the object and to direct the image-making apparatus to this part of the object.

33. A detector as claimed in claim 31, wherein the detector is adapted to detect the location of the reference point on the object and to direct the image analysis equipment to a corresponding part of the image.

34. A detector as claimed in any of claims 31 to 33, wherein the source of electromagnetic radiation comprises a source of ultraviolet light.

35. A detector as claimed in any of claims 31 to 34, wherein the image analysis equipment is adapted to divide the image into a plurality of sub-regions and to count the number of pixels illuminated in

each sub-region to produce an alphanumerical code corresponding to the image.

36. A detector as claimed in any of claims 31 to 35, wherein the detector is adapted to recognise and record information relating to a secondary identifier, and the processing equipment is adapted to compare the alphanumerical code relating to the object to be verified only to alphanumerical codes relating to recorded objects that have the same secondary identifier.